MODELLING AND CONTROL STRATEGY OF BIODIESEL PRODUCTION OF METHANOL IN CONTINUOUS STIR-TANK REACTOR USING PID CONTROLLER IN ASPEN SIMULATION

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AUTHOR'S DECLARATION

I declare that the work in the thesis was carried out in accordance with the regulation of Universiti Teknologi MARA. It is original and is the results of my own, unless otherwise indicated or acknowledge as reference work.

I, hereby acknowledge that I have been supplied with the Academic Rules and Regulations, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Biodiesel is the new alternative source that can replace hydrocarbon oil, this is due to the hydrocarbon source depletion by years. This matter need a proper solution in order to continue the production of vehicle. Recent study shows that there are two method to produce the biodiesel which are the transesterification of alcohol and catalytic cracking of palm oil to lower molecular hydrocarbon. The transesterification reaction usually carried out in the batch reactor, the process variable that need to be consider that will effecting the reaction are temperature, catalyst concentration and type, stirring speed, reactant purify, feedstock viability and the free fatty acid content. There is a lot control strategy that can be used in order to achieve the higher amount of product yield. For an example, the control of reactor temperature, reactor pressure and many more, this parameter that need to consider when to produce the biodiesel. The method for transesterification of CH_4 is firstly, develop the basic block aspen, simulate the rigorous block, then PID control, then tuning the PID controller and lastly test the control parameter. Based on the result obtained, the control can be determine as a good controller because the simulation give a positive result.